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ISTIGOBIUS HOESEI, A NEW GOBIID FISH FROM AUSTRALIA (PERCIFORMES: GOBIIDAE)

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Abstract.—A new species of *Istigobius* is described based on 18 specimens from waters near Sydney, Australia, the only known locality for this species. It differs from all other nominal species of *Istigobius* in its distinctive coloration. The new species is most similar to *I. campbelli,* a species from Japan, China, and Taiwan.

The gobiid taxon *Istigobius* Whitley was elevated to generic status by Hoese and Winterbottom (1979). Prior to this it was widely accepted as, and commonly found in the literature as, *Acentrogobius*. The genus is distributed from the Red Sea to the Marquesas Islands in the Central Pacific. Species of *Istigobius* are sand-dwelling, many being found associated with coral reefs. During the course of a generic revision, we encountered a new species that differs strikingly in coloration from all nominal forms. At present this species has only been collected from waters around Sydney, Australia, and is herein described from 18 specimens.

Methods

Except as indicated, counts and measurements were taken from the left side and follow methods given by Hubbs and Lagler (1958). Head length is taken to the upper attachment of the opercular membrane. In most gobiids the first ray of the second dorsal and anal fins is simple and is included in ray counts. The last ray of each of these fins is branched at the base and is counted as a single element. The longitudinal scale count is taken from the upper attachment of the opercular membrane to the end of the hypural. Transverse scale counts are taken from the anal origin upward and forward to the first dorsal base (TRF) and from the anal origin upward and backward to the second dorsal fin base (TRB). Since the anterior scales are often crowded and irregularly placed, the TRB count generally shows less variation (Hoese and Steene 1978). Predorsal scales extend from just anterior to the first dorsal spine to just posterior to the interorbital region and are counted in a straight-line manner. Postdorsal scales are counted from the end of the second dorsal fin to the upper base of the caudal fin. The vertebral count includes the urostyle. Pectoral fin rays were counted on both sides and tabulated as separate counts.

We follow the methods of Birdsong (1975) in describing the relationship of the spinous dorsal fin pterygiophores with the underlying vertebrae.

All measurements less that 20 mm were made to the nearest 0.01 mm with an ocular micrometer. Measurements greater than 20 mm were made to the nearest 0.1 mm with dial calipers. All fish lengths given are standard lengths (SL).

In the descriptive accounts the values for meristic characters are followed by frequencies of counts in parentheses. The frequency that includes the value for the holotype is italicized.

Fig. 1. Male paratype of *Istigobius hoesei*, AMS I.17657-001, 59.5 mm SL. Photograph by E. O. Murdy.

Istigobius hoesei, new species
Figs. 1, 2

Holotype.—USNM 231865, male, 54.9 mm, 33°50′S 151°16′E, Sydney Harbour, Australia, collected by R. Kuiter on 6 Sept. 1981 with rotenone at a depth of 5–7 m in sandy area near large rocks.

Paratypes.—AMS I. 17657-001, males (54.5 and 59.5), females (40.7, 49.5, 51.1, 51.2, 55.3, 56.1, 60.2, and 66.3), 34°00′S 151°14′E, Bare Island, La Perouse, Botany Bay, New South Wales, R. Kuiter, 15 Dec. 1973; TCWC 3215-1, female (38.6), same data as holotype; BPBM 27826, female (48.6), same data as holotype.

Diagnosis.—A species of moderate size (38.6–66.3 mm SL) normally having second dorsal of I, 10 and anal of I, 9 with pectoral rays usually 17–18. Pelvic fins completely united, I, 5. Nape, breast and pectoral base covered with cycloid scales. Body with 28–33 scale rows. TRB 6.5–8.5. Body irregularly covered with dark spots and faint longitudinal lines. Lateral portions of jaws, especially upper jaws, blackened. Two spots on pectoral base, uppermost one spreading out onto fin rays. First spines and membranous portions of dorsal fins spotted. Males with a flattened, tapering genital papilla, females possessing more bulbous type.

Description.—Dorsal rays VI-I, 10 (*17*), VI-I, 11 (1); anal rays I, 8 (1), I, 9 (*16*), I, 10 (1); pectoral rays (right side) 14 (1), 16 (2), 17 (10), 18 (*4*), 19 (1); pectoral rays (left side) 16 (2), 17 (9), 18 (*5*), 19 (1); segmented caudal rays 17 (*18*); branched caudal rays 14 (7), 15 (9), 16 (*2*); lateral scale rows 28 (1), 29 (3), 30 (*3*), 31 (3), 32 (4), 33 (4); transverse scale rows (TRF) 7 (2), 7.5 (4), 8 (2), 8.5 (*7*), 9 (1), 9.5 (1); transverse scale rows (TRB) 6.5 (1), 7 (3), 7.5 (*7*), 8 (4), 8.5 (1); circumpeduncular scales 12 (*16*); postdorsal scales 5 (1), 5.5 (*1*), 6 (16); predorsal scales 8 (1), 9 (2), 10 (9), 11 (*3*), 12 (1); gill rakers on outer face of first arch 1+4 (6), 1+5 (4). Vertebrae 10+16 (*5*); pterygiophore formula 3 (22110) (*4* specimens), 3 (21210) (1). Morphometric data are given in Table 1.

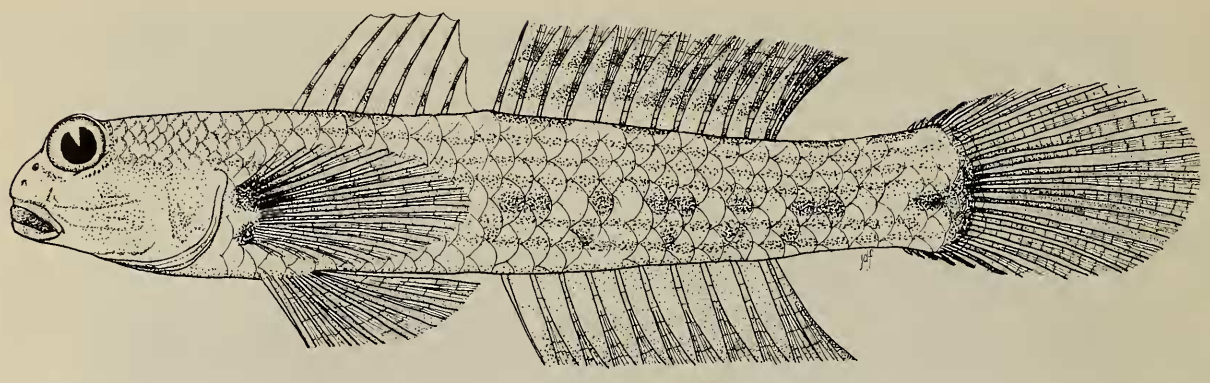

Fig. 2. Female paratype of *Istigobius hoesei*, AMS I.17657-001, 49.5 mm SL. Drawing by Janice D. Fechhelm.

Head slightly depressed, wider than deep. Body compressed. Mouth subterminal. Jaws extended posteriorly to a point under anterior portion of eye. Interorbital very narrow. Anterior nostril a short tube above upper lip. Posterior nostril a simple pore close to anterior margin of eye. Gill opening somewhat restricted, ending at ventral midpoint of operculum. Gill rakers short, about as wide as long. Dorsal and anal rays branched. Fourth spine of first dorsal fin longest. Pectoral fin elongate with pointed tip reaching (in holotype) or almost reaching above anal origin; all but 2 uppermost rays branched. Caudal fin rounded. Pelvics connected by frenum, soft rays all branched; medial rays longest.

Two supraorbital canals (Fig. 3) each terminating medial to a nasal pore; a medial anterior and medial posterior interorbital pore; one postocular pore behind each eye; one infraorbital pore located posterio-ventrally from orbit; lateral canal extending from posterior end of eye to middle of operculum, with one pore at uppermost edge of preoperculum and a terminal pore above the middle of operculum; a short tube with pores at each end above posterior portion of operculum; three preopercular pores, lowest pore in horizontal line behind end of jaws.

No vomerine or palatine teeth. All jaw teeth conical and curved. Jaw teeth tightly packed in 4–5 rows in both upper and lower jaws, outer row in each jaw

Table 1.—Proportional measurements of *Istigobius hoesei* in thousandths of standard length.

Character	Holotype ♂	Paratypes			
		10 ♀		2 ♂	
		Range	Mean	Range	Mean
Standard length (mm)	54.9	38.6–66.3	51.7 ± 8.35	54.5–59.5	57.0 ± 3.53
Proportions					
Head length	.273	.236–.270	.256 ± .010	.250–.260	.255 ± .007
Eye diameter	.061	.055–.072	.064 ± .005	.056–.061	.059 ± .004
Upper jaw length	.088	.068–.087	.076 ± .006	.079–.081	.080 ± .001
Lower jaw length	.076	.063–.080	.070 ± .005	.073–.076	.075 ± .002
Body depth	.164	.164–.193	.174 ± .009	.165–.165	.165 ± .000
Head depth	.182	.151–.180	.167 ± .008	.168–.180	.174 ± .009
Least depth caudal peduncle	.121	.098–.122	.116 ± .007	.118–.119	.119 ± .001
Pectoral length	.273	.251–.290	.270 ± .013	.275–.275	.275 ± .000
Pelvic length	.243	.215–.248	.235 ± .012	.250–.254	.252 ± .003

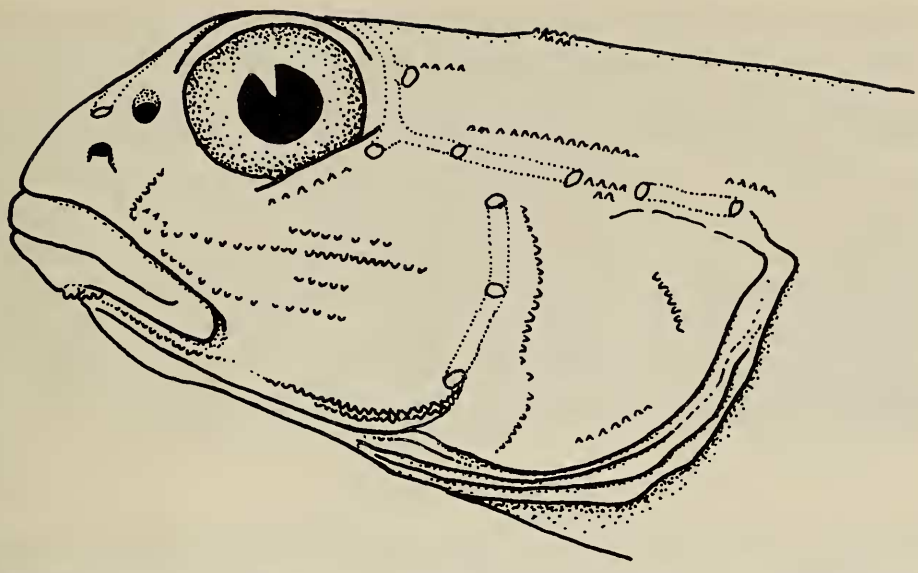

Fig. 3. Pore and papillae patterns of *Istigobius hoesei*.

possessing the largest teeth. Upper jaw with 4 enlarged teeth on outer row, outer row of lower jaw possessing 10 enlarged teeth with two most lateral curved backward.

Body covered with 28–33 scale rows. Scales on nape, breast and pectoral bases cycloid, all others ctenoid. Preoperculum and operculum naked. Isthmus scales extend anteriorly to below midpoint of operculum.

Coloration of freshly preserved and photographed paratype (BPBM 27826) showed head mostly greenish-brown with faint yellow-orange bands diagonally on preoperculum and operculum. Lateral aspect of upper jaw black with some blackened areas in preoperculum. Body with 5–6 greenish-brown longitudinal lines on grayish-white background, reddish-orange spots and dashes dorsally. Reddish-brown mid-lateral spots with 6–8 reddish-brown spots ventro-laterally. Dorsal fins with red and white spots on first spines and on membranes. Orange stripe basally on anal fin. Three horizontal bands on fleshy pectoral-fin bases. Two brown spots on pectoral-fin bases, uppermost one spreading onto fin rays. A metallic green glistening ventrally is sometimes retained in preserved specimens. Caudal fin possessing some faint yellow streaks.

In preservation, head and body brownish. Gray, tan or white ventrally. Some specimens with horizontal dark bars beneath eyes. Upper jaw black on posterio-lateral aspect. Body mottled with irregular markings. Generally, 6–8 dark spots discernible ventro-laterally. Two dark spots on pectoral-fin bases, uppermost one spreading onto fin rays. Dark spots on first spines and membranes of dorsal fins. Males with darkened pelvic and anal fins with elongation of soft dorsal and anal fins, which is characteristic of most species of *Istigobius* examined.

Distribution.—Collected only in bays near Sydney, New South Wales, Australia.

Ecology.—The holotype and two paratypes were taken on sand near large rocks at a depth of 5–7 m. Water temperature at the time of collection was 14°C.

Etymology.—The species is named for Douglass F. Hoese, for his contributions towards a better understanding of gobioid systematics.

Relationships.—*Istigobius hoesei* is most similar to *Istigobius campbelli* (Jor-

dan and Snyder, 1901) which is found in Japan, China, and Taiwan. *Istigobius cambelli* differs from *I. hoesei* in possessing a dark bar from the eye to the upper pectoral-fin base, lacking blackened portions on the lateral aspects of upper jaw, isthmus being scaled anteriorly to below distal portion of preoperculum, generally deeper body, larger size, and more uniform pattern of spots. Field data included with two specimens of *I. campbelli* collected in Taiwan by V. G. Springer (VGS 68-28) indicated these fishes were also collected near rocks at a depth of 5 m. These Taiwanese specimens of *I. campbelli* are not as deep bodied as more northerly conspecifics and are the most similar to *I. hoesei,* but the two species are easily distinguishable by the characteristics given above. *Istigobius hoesei* is easily distinguishable from all other *Istigobius* on color alone.

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